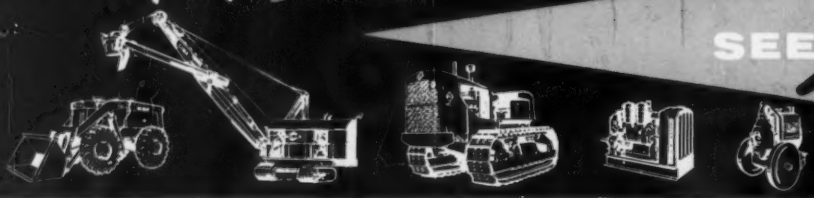
MINING '58

Allis-Chalmers HD-21 and Lima 2400 form profit-winning team for Snyder Coal Co., Cowansville.

25TH Anniversary HIGHWAY EQUIPMENT CO. 1933 · 1958

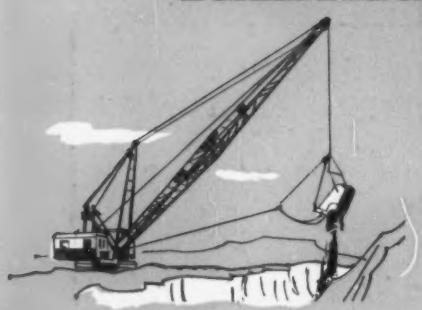
For the best in all types of mining equipment...

SEE *Highway* FIRST!



Lima 2400 strips overburden for Iseman Bros., New Bethlehem.

familiar sight at successful mines... Lima 2400



Profitable coal stripping depends almost entirely upon the proper use of good equipment. For that reason, leading mine operators depend on Lima 2400s . . . sold, serviced and guaranteed by Highway.

Among the quality features of Limas are air operated clutches that assure complete ease of handling, anti-friction bearings at all bearing points and torque converter that automatically adjusts speed to load requirements.

For the rest of the Lima story, see your Highway representative today.

Highway

HIGHWAY EQUIPMENT COMPANY

6465 Hamilton Ave. • Pittsburgh, Pa.

Allis-Chalmers • Lima Shovels, Cranes, Draglines • Master
General Motors Diesel Engines • Power-Pack Conveyors
Gar Wood • Lima Roadpackers • Burmeister Mixers and Bins
Michigan Tractor Shovels and Excavator-Cranes
Thor • Jaeger

25th Anniversary HIGHWAY EQUIPMENT CO.

Published monthly by Modern Mining Publishing Company. Publication Office—Advance Printing & Litho Co., Erie, Pa. Editorial and Executive Offices, Erie, Pa. Pittsburgh Office: P. F. JASIK, Publisher, 4575 Country Club Drive, Pittsburgh 36, Pa. Price: In the United States, $3.00 year: all other countries $5.00. Single copy 25 cents. Entered as second class matter at the Post Office at Erie, Penna., under the act of March 3, 1879.

STOCKPILING COAL for the William Aloe Coal Co., this 1¼-yd. shovel gets its power from a Cat D8800 Engine. A D13000 powers a 1½-yd. shovel, also stockpiling coal.

LOADING OUT COAL in the operation of the William Aloe Coal Co., this 2½-yd. shovel is powered by a Caterpillar D337 (Series F) Turbocharged Engine.

Standardize on CAT Diesel power for the tough mining jobs

A. J. Schmidt, Purchasing Agent of the William Aloe Coal Co. at Imperial, Pa., now relies on Caterpillar for 100% of his engine power requirements in coal loading operations

That's a sound move for *any* mine. When you're powered 100% with Cat Diesels, you're sure of dependable performance in *every* phase of your engine power requirements. Their reliability has been a byword on punishing applications for more than 25 years, because they were built for the hard work. Today, as a result of constant development, these modern heavy-duty units are tougher and more efficient than ever.

One of the big reasons for the complete acceptance of the Caterpillar Engine is the fuel injection system. Here's how it provides profitable production:

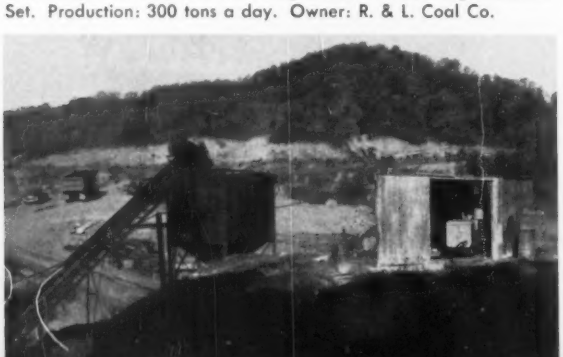
1. Maintains loads for long periods without power drop.
2. Idles smoothly and runs steadily on all cylinders.
3. Handles variable loads with quick response.
4. Burns a wide variety of low-cost fuels without added maintenance costs.
5. Is free from frequent checks and adjustments.

For complete information about Cat Engines and Electric Sets see one of Beckwith Machinery Company's Engine Specialists. He knows your power requirements and we back your purchase with fast, efficient service and high quality factory parts. For original or replacement power—for honestly rated, certified power—give us a call!

CAT INDUSTRIAL ENGINES 10 sizes up to 650 HP (maximum output capacity). Most leading manufacturers can furnish machines with Cat Engines on request.

CAT ELECTRIC SETS 12 sets up to 350 KW (continuous duty) with the Cat Generator. All Cat Electric Sets and Engines come with a notarized certificate of capacity.

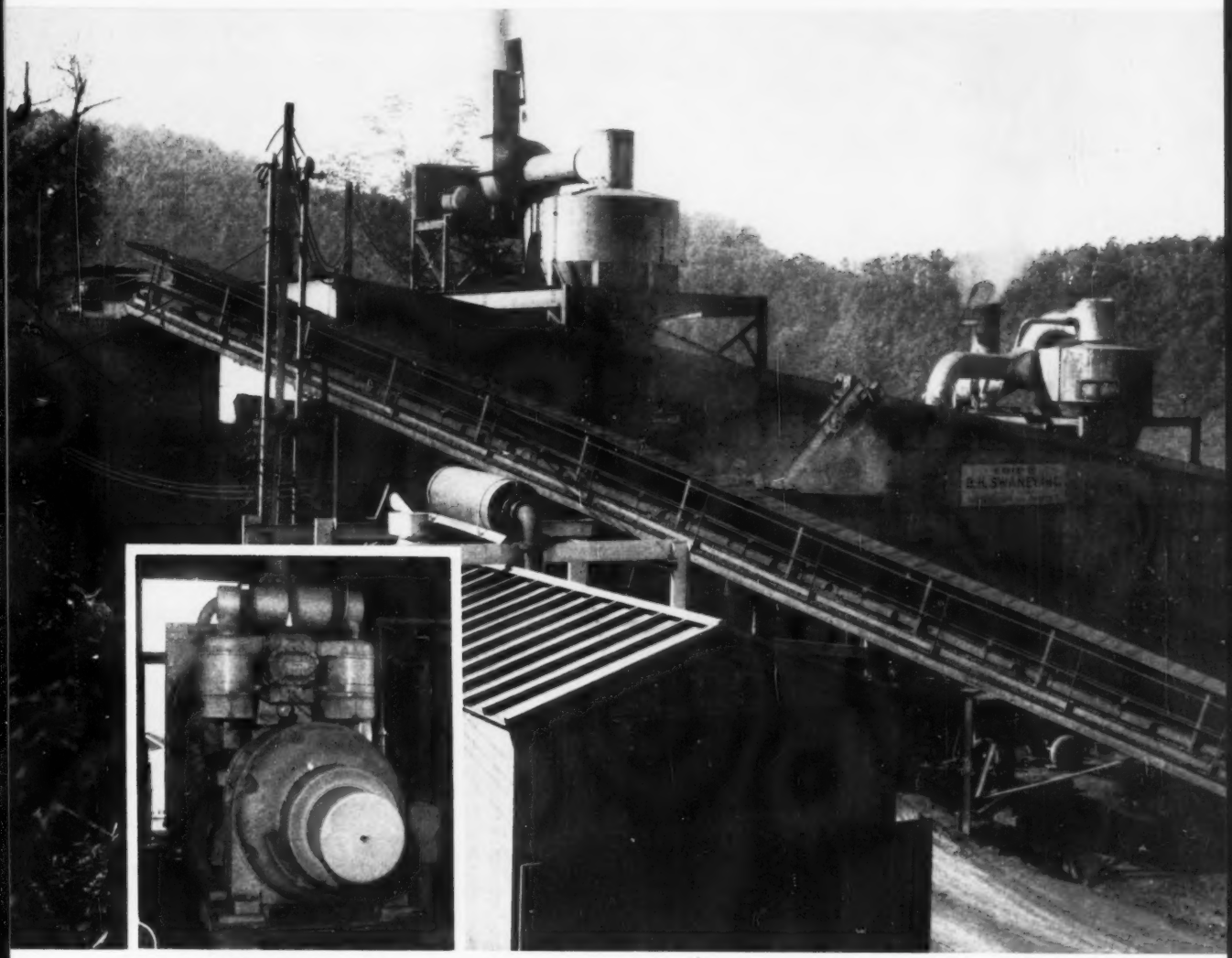
ELECTRICAL POWER for exhaust fan, pin timbering machine, shop cutting machine, loader, conveyor to tipple, grinder and lights at Overfield, West Va., is furnished by a D337 Turbocharged Electric Set. Production: 300 tons a day. Owner: R. & L. Coal Co.



STRIPPING OVERBURDEN from coal, this shovel with 5½-yd. bucket maintains profitable production powered by a Cat D397 (Series D) Turbocharged Engine. Owner: Keeley Construction Co., Clarksburg, West Virginia.

FOR MORE PROFITS PER TON RELY ON CAT DIESEL POWER FROM BECKWITH

ENGINE POWER BY CATERPILLAR



FURNISHING POWER FOR THE ENTIRE TIPPLE, this Cat D397 Electric Set often starts Monday morning and doesn't shut down until Saturday night. Tipple consists of 2 crushers, 3 vibrators, 10 flight conveyors, furnace, air cleaner and washer. Production: 1,500 tons a day. Owner B. H. Swaney, Inc., Charlesburg, West Virginia.

Dept. CM, Engine Division
BECKWITH MACHINERY CO., 6550 Hamilton Ave., Pittsburgh 6, Pa.
Send me more information about Caterpillar Diesel Engines. I have checked the proper box to guide your selection of material.

- ☐ I would like detailed information, as I may be in the market for a Cat Diesel Engine or Electric Set. I understand that I am under no obligation.
- ☐ I am interested in learning more about these engines.

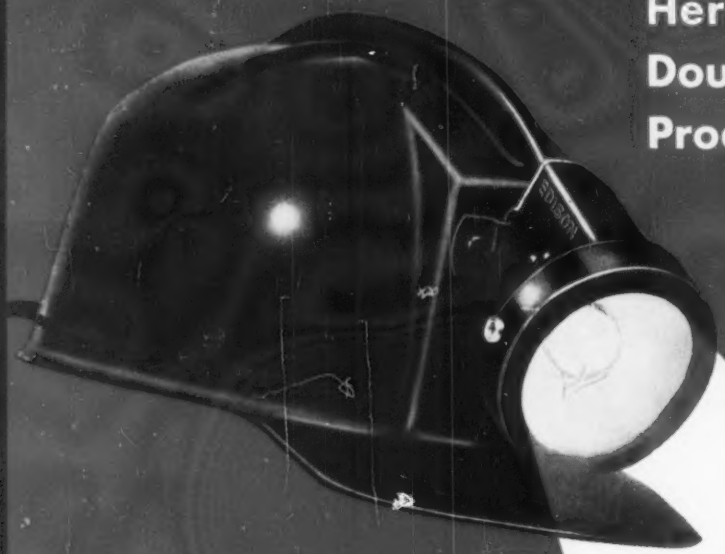
Name _____
Company _____
Address _____
City _____ *Zone* ____ *State* _____

BECKWITH MACHINERY CO.

BRADFORD, PA. • 361-369 Congress St. • Phone 3166
CLEARFIELD, PA. • Old Town Rd. • Phone 5-9635
ERIE, PA. • 1356 E. 12th St. • Phone 4-2494
FARRELL, PA. • E. Broadway • Phone Di. 6-3572
CLARKSBURG, W.VA. • U.S. Rt. 20 • Phone Main 4-5476

6550 Hamilton Avenue • PITTSBURGH • Phone: MOntrose 1-6900

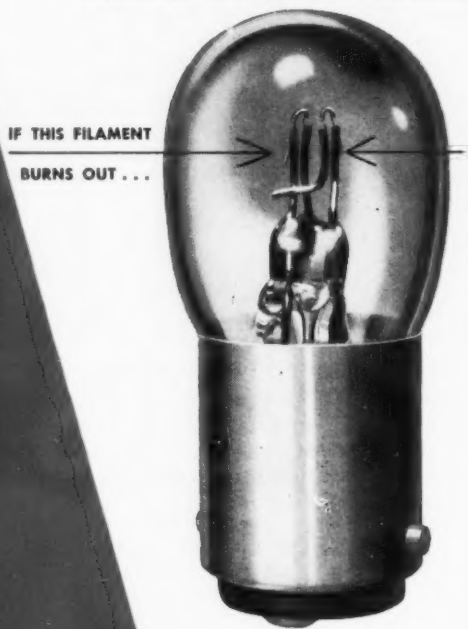
Here's why the Edison R-4 Double Filament Bulb saves Productive Man-hours— promotes greater underground safety



With the Edison R-4 double filament bulb, a burned-out filament doesn't mean lost time for the miner or a short crew for the foreman. A turn of the switch transfers the power of the unfailing Edison battery to the second filament—restores *continued, brilliant illumination*. There is only one bulb, located in the center of the headpiece, which gives the advantage of maximum reflector area.

This reserve protection saves hundreds of man-hours every year, adds an extra margin of safety. Write for full details.

BURN-OUT doesn't mean BLACKOUT



MSA

SAFETY EQUIPMENT HEADQUARTERS

MINE SAFETY APPLIANCES COMPANY

201 North Braddock Avenue, Pittsburgh 8, Pa.

At Your Service: 77 Branch Offices in the United States and Mexico

MINE SAFETY APPLIANCES CO. OF CANADA, LTD.

Toronto, Montreal, Calgary, Edmonton, Winnipeg, Vancouver, Sydney, N.S.

When you have a safety problem, M.S.A. is at your service . . . our job is to help you

COAL MINING

Vol. XXXV February, 1958 No. 2

Contents

Published by

Modern Mining Publishing Company

4575 Country Club Drive

Pittsburgh, Pa. Phone TU. 1-9411

P. F. JASIK, Publisher and Editor

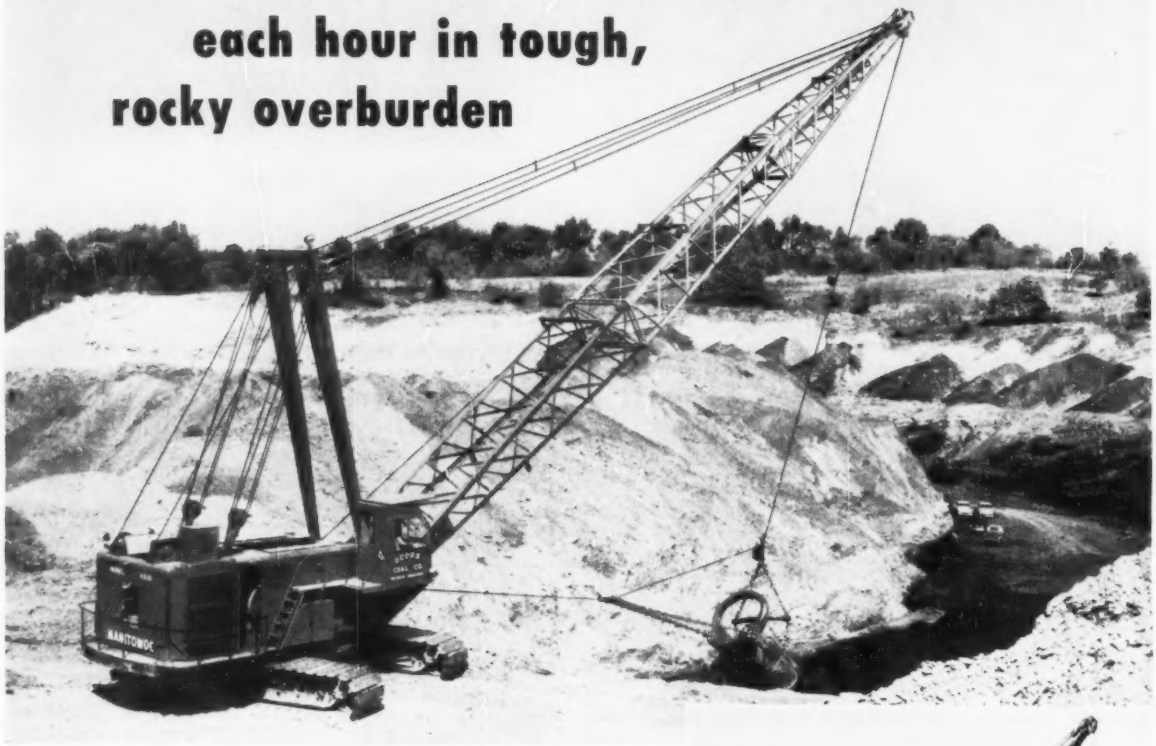
Philadelphia Representative
PAUL S. KEISER
1729 Ridgeway Road Havertown, Pa.

☆

Printed by

ADVANCE PRINTING & LITHO CO.
1118 Chestnut St.
Erie, Pa. Phone 2-2780

MANITOWOC 5½-yd. drag makes 80 passes each hour in tough, rocky overburden



Two 5½-yd. Manitowoc Model 4500 draglines are opening new coal mining areas for the Dodds Coal Co., New Galilee, Pa. Both of the drags operate 20 hours at a stretch, with one unit averaging 80 passes per hour of hard-to-handle overburden. Approximately 8800 cu. yds. are moved each day by this machine, pictured above working a cut 100′ wide and 70′ deep and equipped with a 120′ boom.

The Manitowoc units have the capacity, flexibility and range to consistently produce big output at a profit for the Dodds Co. Since the Model 4500's have a single diesel power package they are not restricted by trailing electrical cables and the need to work close to power installations. Simple design — no complicated electrical motors, switches or miles of wiring — has kept the big draglines working constantly with little downtime for maintenance. All lubrication can be handled from the inside with the exception of the fairlead and seven fittings. And these are greased in minutes, usually during a shift change.

The Dodds Company's Manitowocs were set up in only three days, compared to weeks of set-up time required by other rigs of this capacity. And on-the-job mobility is superior, too, with speed and ease of handling equal to a crawler tractor.

Repeat orders from every coal mining area are proof of Model 4500 performance. Ask your Manitowoc distributor for complete literature and specifications.

MANITOWOC ENGINEERING CORP. MANITOWOC, WIS.

BASSLER EQUIPMENT CO.
FORTY FORT, PA

ANDERSON EQUIPMENT CO.
BRIDGEVILLE, PA.

REMOVING BOULDERS UP TO 15 TONS APIECE, a second Manitowoc Model 4500 owned by the Dodds Coal Co. works a 200′ wide cut. Skillful handling of the drag enables the huge boulders to be moved with comparative ease. The amount of blasting usually required for removing rough overburden like this is greatly reduced.

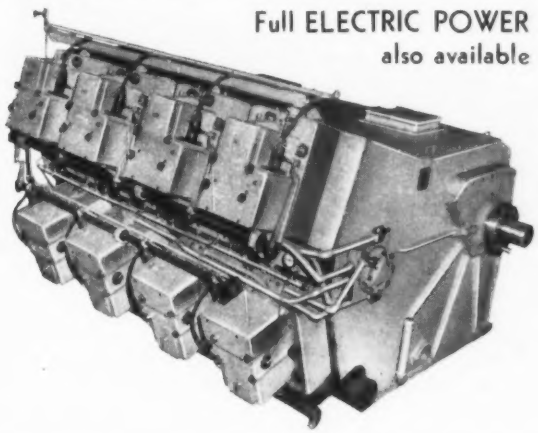
FOR **HIGH PRODUCTION** AND **LOWEST OPERATING** COSTS—

NOTHING equals the PAGE 700 SERIES SINGLE DECK WALKING DRAGLINE

5 to 22 cubic yard capacities

Powered by the
DRAGLINE-PROVED PAGE
HORIZONTAL V-TYPE DIESEL

Full ELECTRIC POWER
also available



The Page Engines powering 700 Series Draglines are designed specifically for dragline work . . . to work longer, at lower cost, with less downtime and maintenance than any other engine. Big bearings, big pistons, a short, stiff crankshaft and slow (450 RPM) speed are only part of the story of why many Page Diesels are still producing maximum horsepower after 20 years of operation. Bulletin WDSD-155 has full details.

Page 700 Series Draglines are rugged, compact, work-horse machines. They are designed and built with the fastest practical hoist and swing speed to reduce cycle time and increase yardage. Page Diesel or full Electric power.

The Page 700 Series Dragline is proof that a fast, efficient, medium-sized machine will *consistently* out-perform larger, but slower machines in virtually every kind of digging.

In addition, initial investment for a Page 700 Series Walking Dragline is considerably smaller, and operating and maintenance costs are lower. *Want more details? Write for Bulletin WDSD-155 today. There's no obligation.*

FRANK SWABB EQUIPMENT CO.
Hazleton National Bank Bldg.
Hazleton, Pa., Phone Gladstone 5-3658

Page
Automatic Dragline Buckets
Walking Draglines

Do You Know?

An electronic computer-automatic tool system that will help design a part, then automatically produce it is foreseen by Dr. Douglas T. Ross of Massachusetts Institute of Technology.

He told the American Association for the Advancement of Science that present work at MIT is leading to such a "design machine."

Although the immediate importance of these machines seems to be industrial, Dr. Ross said the "true impact" may lie more in the scientific world. The reason is that such a machine, for the first time, permits abstract knowledge to be applied directly to physical processes. This is expected to yield new insights into problem-solving methods.

Electronic computers have to be fed exact instructions before they can do their calculations. Preparing these instructions is known as programming and is a long, tedious job for humans.

Dr. Ross reported that a new, significant advance in programming, called the "systematized solution," has been made at MIT. This concept allows any of a class of related problems to be solved merely by putting "flesh" on a single skeleton program. Continued work along these lines is expected to result in the design machine that will also produce a part to meet the specific requirements.

America's engineering profession is more of a "ladder" by which young men from lower-middle families climb to managerial positions in industry, than a socially-fixed "class."

This is the conclusion of Dr. Edwin T. Layton, who recently completed a doctoral dissertation at the University of California at Los Angeles on "The American Engineering Profession and the Idea of Social Responsibility."

Dr. Layton, who is now a member of the history faculty at the University of Wisconsin, believes certain social conditions have had a profound effect on the engineer's attempts to define and act upon his sense of social responsibility.

One of the most important has been vertical social mobility and its counterpart, "the philosophy of success."

Such social mobility has left its mark on the mind of the engineer in the form of three contradictory sets of ideas, says Dr. Layton. The first concerns individualistic values, a second science, and a third defines the relationship between engineering and business.

Each of these concepts, Dr. Layton believes, implies a different idea of social responsibility. And, as a result, attempts by the engineering profession to take social action have led to bitter disagreements and internecine warfare.

HERE AND THERE IN THE COAL INDUSTRY

● L. H. Chalfant has been appointed manager of Bethlehem Mines Corporation, Johnstown, Pa., succeeding T. J. Crocker whose retirement became effective February 1. E. R. Luy, superintendent of the corporation's Barbour-Randolph Division, Buckhannon, W. Va., succeeds Mr. Chalfant as assistant general manager.

Henry R. Hall, superintendent of No. 44 mine at Idamay, W. Va., will replace Mr. Luy at the Barbour-Randolph Division.

● James F. Wildey has been appointed to the newly created position of director of safety and inspection for Bethlehem Mines Corporation, with headquarters in Johnstown, Pa. Since 1948 he has worked in various positions in the mechanical department at the corporation's Marion Division, Fairmont, W. Va.

● J. E. Osmanski, manager of personnel for the operating department of Island Creek Coal Co., at Holden, W. Va., has been transferred to Huntington as manager of company-wide personnel activities, effective Jan. 1. R. E. Shelton, who has held several positions in the operating department's personnel and industrial relations division at Holden since 1948, has been appointed successor to Mr. Osmanski at Holden.

OPENING A NEW MINE PREPARATION PLANT DESIGN

by F. R. ZACHAR

Prior to any engineering considerations as to plant details, the operating company considering construction must, above all, first determine just what is the plant's purpose and reason for being. This sounds quite elementary, but in many cases is not given the full and exacting examination due a construction project which must perform satisfactorily for a number of years, and which may involve the expenditure of several millions of dollars. Preparation plants are built primarily to enable the producer to meet consumer requirements for the finished product, not to provide new and more complicated ways of doing things with coal and water. I like to keep in mind the advice of J. B. Morrow who has written:

"The consumer is primarily interested in the most economic utilization of a fuel. This implies that it must be inherently suited to his particular use. The consumer can only afford to pay for a uniformly prepared product which produces tangible results and the producer cannot profit on any part of his preparation that does not add to the realizable value of his products, nor can he expect to be compensated for uneconomical cleaning methods.

"Ultimately, then the yardstick of the consumer is the most important factor, and the design and control of the preparation plant should be mainly based on it, giving due consideration to the cost of the process as compared to the realization.

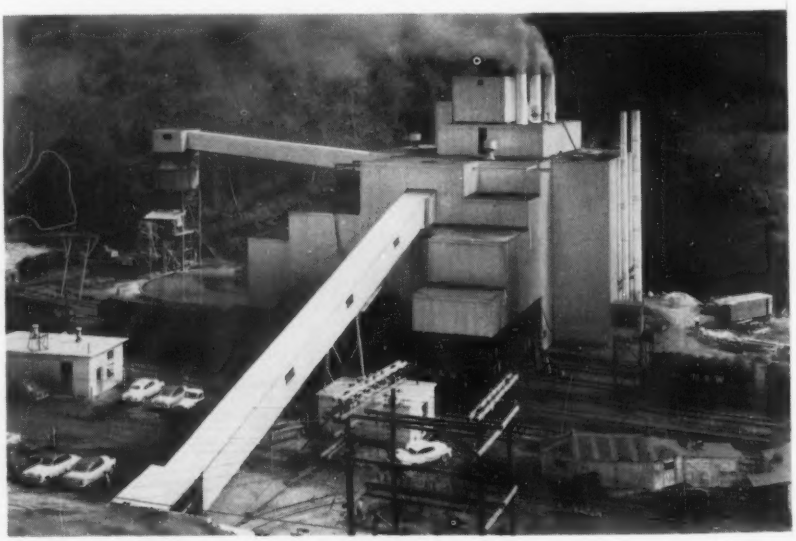
"The technology is secondary, although it will point the way to economically meeting the desired standards, and hence to an ultimate saving on the part of the consumer."

When the producer has determined the extent of his immediate preparation needs, he might be well advised to outline to his engineers some idea as to what possible changes the future might bring. The plant washing only plus 3/8" today might well be required to wash to 0" in the future, and a plant using only mechanical drying methods might well be required to utilize thermal drying at a later date. Predesign knowledge of possible future requirements will enable design and plant layout to better accept these additions if and when they become necessary.

Raw coal characteristics with respect to size consist, percent moisture, and washability are of obvious importance to plant design and equipment selection. Equally important are the qualities to be realized in the plant product. Necessary percent ash reduction, final product moistures, and percent plant reject will influence selection of equipment and design capacities. When the decision is made as to what is to be done and by what means these processes will be carried out, there are three basic evaluations to be made against the preliminary decisions: (1) Is it as simple as possible; (2) Is it flexible and adaptable to change and addition, and (3) Is its capacity as high as practical.

While the above are being given their due consideration, it would be well to analyze some of the major problems which, while apart from the plant itself, are definitely related to plant design. These problems as discussed herein, are not necessarily in order of their importance, but must be carefully considered and properly handled to obtain best overall project design.

Disposal of plant refuse must be thoroughly planned and, whether the refuse be transported by belt, truck, aerial tram, or pipe line, there are several questions that must be answered prior to project design. First, is the available disposal area large enough to permit disposal of all the refuse that will be produced during the life of the plant. Another good question is whether or not the selected site and transportation method lend themselves to economical suppression of gob fire. Of course the



Two men can control the entire operation of a new Link-Belt push-button coal preparation plant which washes, dries and screens 450 tons of run-of-mine coal an hour at Clinchfield Coal Co.'s No. 2 mine.

economics of the whole refuse disposal system must be given careful thought; it is important that refuse handling costs be estimated on a cost per-ton of refuse basis as well as on cost per-ton of clean coal.

Plant water requirements and available fresh water supply are very important considerations in plant location. Not all operations are fortunate enough to be located along a river, and available water can often determine possible work days per year. For those mines using river water, it would be well to investigate the quality of the water by getting data on acidity and percent solids. Such data may dictate treatment to forestall undue maintenance due to corrosion.

Where the plant product is to be loaded on rail, the empty and loaded storage yards should be given at least preliminary planning time. Once the plant is definitely located, fixed clearances and minimum heights will usually fix track locations. It is entirely possible that a little preliminary investigation might save excess grading costs. The track layout itself should be tied in with the estimated percentage of coal to be loaded on each loading track and switches, crossovers, etc., laid out to facilitate car handling.

If any or all plant product is to be loaded on river, necessary empty and loaded barge storage area should be determined, keeping in mind the possible maximum tons per day to be should be tied in with the estimated loaded. The river site itself may be fixed, but if at all possible, docks should be upstream of major creeks or drains which may deposit silt in the dock area, causing dredging expense. The ideal dock site is one which has all mooring cells in line. This is quite often not possible, and dock layout should be given careful consideration to facilitate barge handling. Other points, such as number of different products that may be loaded, permissible storage width, maximum expected rise from normal pool, etc., are important to the design of dock loading facilities.

Another important point to be considered prior to plant design is the raw coal storage or surge capacity needed, and whether or not these storage facilities need be blending facilities as well. Most preparation plants are expected to turn out a product of some uniformity and this may be rather difficult to do if raw coal feed to the plant is not relatively uniform. It is extremely nice to have a huge raw coal storage capacity between the mine and the plant, but caution should be used in evaluating the economies of extra large expenditures for this purpose.

There are also the problems of air and stream pollution to be reckoned with. These are usually peculiar to individual plant locations, but must be given just consideration with anticipation that anti-pollution requirements may or will become more strict, rather than more relaxed, during the life of the plant.

Plant product requirements will usually dictate whether the plant washes only "coarse coal" or "washes to zero." The choice is not always open to the producer, but it should be remembered that capital and operating preparation costs for minus 3/8" coal are usually about three times those of the plus 3/8" product.

If coal is to be washed to zero the operator has a choice of doing so in a single type of equipment or of screening raw and using separate devices for coarse and fine coals. Each system has its advantages and disadvantages and there is no one "best way." Those contemplating preparation plants are urged to give more than normal consideration to this point and to strive for complete flexibility.

Remembering Mr. Morow's admonition, any process involving the wetting and drying of fine coal and the consequent handling of resultant slurries should be carefully scrutinized for adequacy and simplicity, with special emphasis on the latter.

In preparing a plant layout, there are three basic provisions around which all other functions must evolve. These are (1) raw coal must come in to the plant, (2) clean coal must go out, and (3) plant refuse must go out. Determination of general location of where these three things are to happen should be the first step in plant layout. If the processes for washing, dewatering, drying, and necessary slurry handling have been determined to be adequate and as simplified as practical, the layout of equipment to carry out these processes can then be worked into the plant design determining general overall dimensions. The following is a list of ten desirable features in a plant layout.

1. Simplified flow.
2. Flexibility of units and flow.
3. Minimum of units and interchangability.
4. Gravity flow where possible.
5. Minimum of necessary connected horsepower.
6. Unit accessability — avoid crowding.
7. Preplanned walkways and stairways.
8. Adequate hoistways and/or elevator in most advantageous location as practical.
9. Preplanned access roads and outside hoistways.
10. Preplanned supply room and shop areas.

Certainly there are items of importance other than these as listed above, but in general successful accomplishment of these ten will go a long way toward arriving at a satisfactory layout.

The following briefly touches on some of the more prominent details of plant structural design. Complete discussion cannot be devoted herein to these details and they are presented in rough outline as some of the things to look at or for.

FOUNDATIONS

1. Sub-soil should be tested and information used to determine bearing strength of general area. These tests will indicate grading costs or necessity of piling.

2. Plant storm, sanitary, and emergency overflow drains should be incorporated in foundation planning.

3. Foundation design should be kept as simple as possible, avoiding haunches, complicated corners. wall

bearing beams, etc., as practical.

4. Before pouring, each column ped should be checked for area by impact soil test in excavated area. This eliminates assumpting that soil bearing is up to designer's estimate.

5. All column foundations should be provided with grouted-in steel plate set by instrument. This will greatly help erection crews in setting plumb columns.

STEEL STRUCTURE

1. Structure should be designed for loadings with ample provision made to insure adequacy for future occupancy of presently unoccupied areas.

2. The economics of bolting, as against riveting, should be looked into with lower erection costs as the object.

3. Certain equipment induces structural vibration unless provided for in original design.

4. The steel structure should be designed with erection ease in mind. Erection supervisors might well be given opportunity to review design and overall layout so as to better plan location of permanent cranes or stiff legs and to plan necessary booms on mobile cranes. Also, storage area for incoming steel and equipment, rail sidings, truck roads and other considerations so important to efficient erection should be reviewed prior to construction.

5. While not a part of steel structure, plant floors must be considered during structure design. In layout work machinery is usually placed with relation to top of steel supporting floors. Concrete floors should be planned early in the design to make sure motor and machinery bases are of proper height. Floor drains should not be made the last item designed, but should be planned ahead so concrete floor slopes and thicknesses can be properly determined. Also, where concrete floors are poured over corrugated metal and mesh, it is quite costly to provide pipe and conduit openings after floor is poured. It certainly is a low-cost precaution to install sleeves at all columns so that if pipe or conduit needs to pass through the floor at any of these points only the corrugated metal need be cut. Generally, though, it is much better to have piping planned prior to floor design.

EQUIPMENT

The scope of this paper does not permit a complete discussion of all the various items of equipment that might be incorporated into a large modorn preparation plant. We shall, however, outline only a few points with regard to several pieces of equipment that are used in almost all plants. The thinking is the same for other equipment, and each should be given a complete and thorough analysis in the engineering stage.

1. SCREENS

(a) Provide at least 50% excess screening capacity when selecting dry raw coal screening equipment.

(b) Provide clearances for quick screen changes.

(c) Provide room for future dust hoods on dry screens.

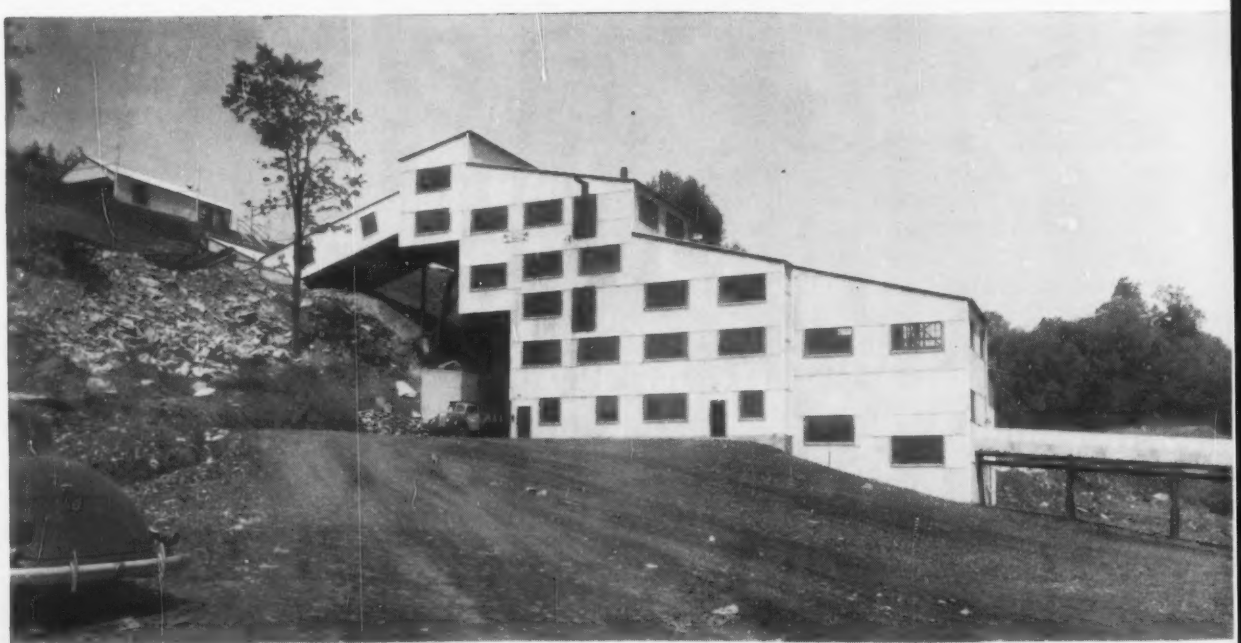
(d) On feed troughs to dewatering screens provide fixed screen launders ahead of screens.

(e) Investigate additional types before accepting high-cost shaker screens and necessary structural supporting members.

(f) Careful consideration should be given screen cloth support and unsupported span widths.

(g) Before selecting single deck vibrating screens, careful sonsideration should be given to the possibilities of wanting additional separation in the future. Double deck frames, equipped with single deck, may be elected in many cases.

Preparation plant built by Roberts & Schaefer Co. for the



2. PUMPS

(a) Where variation in pump discharge may be necessary, such as main sand pumps on Chance systems, variable pitch drives should be provided.

(b) Provide adequate size on all pumps, but select drives so speed can be increased or decreased somewhat and still keep practical pump efficiencies and motor loads.

(c) Provide adequate suction line capacity and select suction line shut-off valves that are full port opening.

(d) Provide full port discharge line regulating valves, but try to select pump drive to eliminate necessity of discharge line regulation.

(e) Locate pumps with sufficient clearances to permit maintenance.

(f) Provide a good gland water system and protective devices.

(g) Ammeters at control panel are often most helpful to plant operators. The performance of pumps is determined at a glance.

(h) Percent solids and type of solids to be handled must be given proper consideration in individual pump selection.

3. BELT CONVEYORS

(a) Belt conveyors should be provided with sufficient width to permit practical increase of capacity by speed increase without motor and reducer overloads.

(b) Conveyors should be duplicated as to component parts as much as possible, using design speeds to vary capacities.

(c) Discharge pulleys should be kept over receiving hoppers in such a manner as to permit belt wiper products going with belt discharge.

(d) Right angle loading should be eliminated if possible.

(e) Provide drip pans in initial design or at least leave room for pans to protect equipment and walkways below.

(f) Utilize wound rotor motors on units requiring 100 h.p. or more, particularly where tensions under starting conditions need regulation.

(g) Accessibility of grease fittings on idlers and pillow blocks should be provided in design.

(h) Gravity take-ups should be eliminated where practical, but, where capacity or length may be increased in the future, care must be taken to provide for proper take-up.

4. DRAG CONVEYORS

(a) These units are normally high initial cost and high maintenance cost items, and should be eliminated where possible. Certain mixing and distribution conveyors must necessarily be drags, but in general chutes or belts are preferred.

(b) Where drags are necessary the design should be carefully checked to assure easy replacement of flights, wear bars, and bottom liners.

(c) Provide instantaneous overload protection.

5. FLUMES AND CHUTES

(a) The duty of each chute in tons-per-year, as well as in tons-per-hour, should be considered in determining size and design of liner.

(b) Right angle turns are always very objectionable and should be avoided.

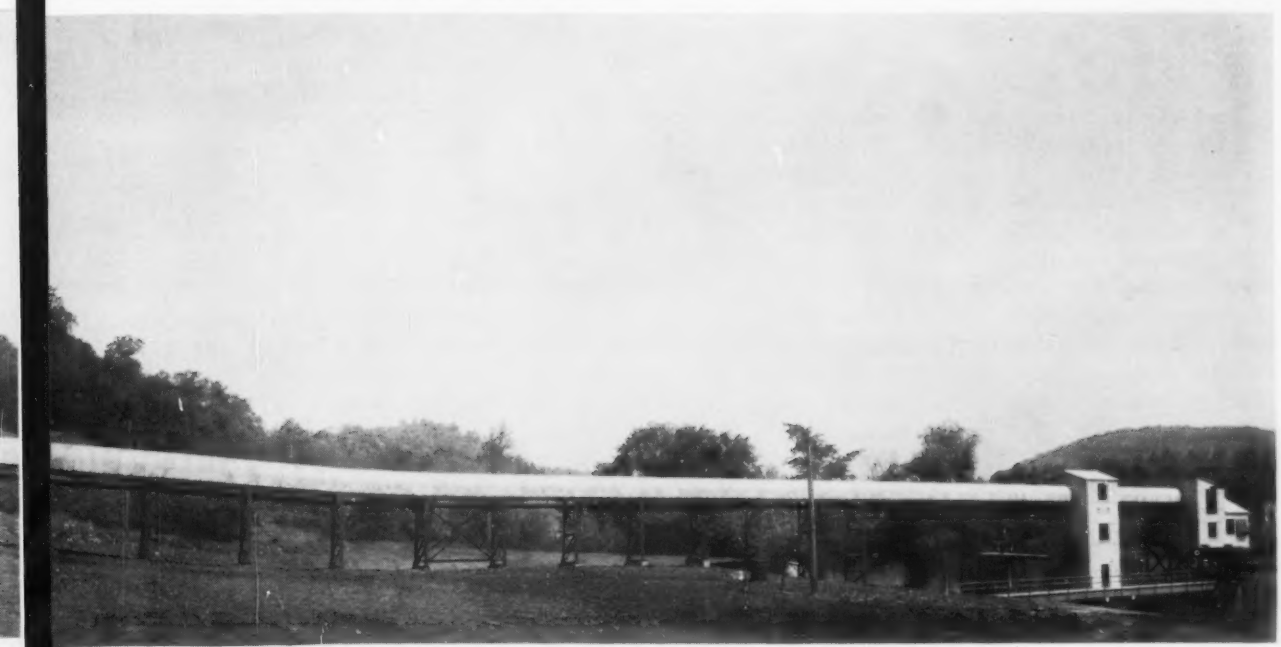
(c) Cover plate requirements must be considered to avoid flume splash and leakage.

(d) Liner material is very important and may vary from mild steel to stainless or ceramic tile or concrete, but should be given careful consideration.

INTERCHANGABILITY

It is always advantageous from a supply - handling and maintenance standpoint to incorporate as much unit interchangability as possible in-

Duquesne Light Co. at Warwick, Pa., washing 6 by ⅜ sizes.



to the plant design. This must be handled from a practical standpoint, but through investigation will often disclose many more possibilities than appear at first glance. In preparing preliminary specifications for design engineers, certain stipulations can guide their thinking and eliminate later design changes. The following are only a very few of the writer's personal recommendations, and are presented herein only to make a point — obviously there are many more:

1. All driven sprockets on roller chain drives should be 60 tooth.

2. Minimum roller chain should be 120.

3. Motors of the same horsepower should have the same speed where possible, and should carry the same NEMA frame number.

4. Shafting and anti-friction bearings can be held to only a few standard sizes.

5. Drag conveyor chain, unless conveyor is of extremely low capacity, should be made the same.

6. Pump interchangability, if given proper consideration, can often eliminate need for spares or excess spare parts.

ELECTRICAL

In a large plant economics dictate bussing 2200 or 4160 volt power to operating voltage load centers located near the motors served. A very careful study should be made of starting sequence and interlocking requirements, after which the individual motors can be relegated to load centers. In assigning motors to load centers no 500 KVA load center should have as much as 500 connected horsepower assigns to it in the plant design, but rather each load center should have spare KVA capacity for future installations not foreseeable in the design stage.

It is often quite economical to utilize high voltage motors for some units. A good arbitrary rule is to use high voltage (2200 or 4160) for motors of 100 h.p. or more,, and to use 440 volt motors where less than 100 h.p. is required. However, each plant must be considered individually in determining these economics.

It is very urgently recommended that all control equipment be furnished from one manufacturer. This is quite important and certainly lends itself to a more easily maintained control system.

As to wiring methods, the writer prefers to use multiple conductor, coded, armored cable in expanded metal raceways for control wiring and single conductor wire of proper size and insulation in rigid conduit for power distribution. There are many ideas on this, but the object of the designer should be to give the operating and maintenance organization a wiring system that will be the easiest to trace and maintain.

The main transformer bank at the plant should be of sufficient capacity originally to provide for future plant loads. No rule of thumb applies, but 5000 KVA should be provided for a plant with 4000 connected horsepower.

Grounding circuits should be given advance consideration and mats installed prior to final grading. It might be considered good practice to frame ground all motors above 400 volts to an independent grounding circuit, rather than to ground to structure.

Plant lighting is very important and deserves considerable thought in its planning. It is urgently recommended that a thorough study be made of initial and operating costs of fluorescent versus incandescent before selection is made. Lighting circuits should be planned and it is quite often most convenient to locate distribution panels at the head of stairs. Idle time circuits can be incorporated quite reasonably with assured savings.

PAINTING

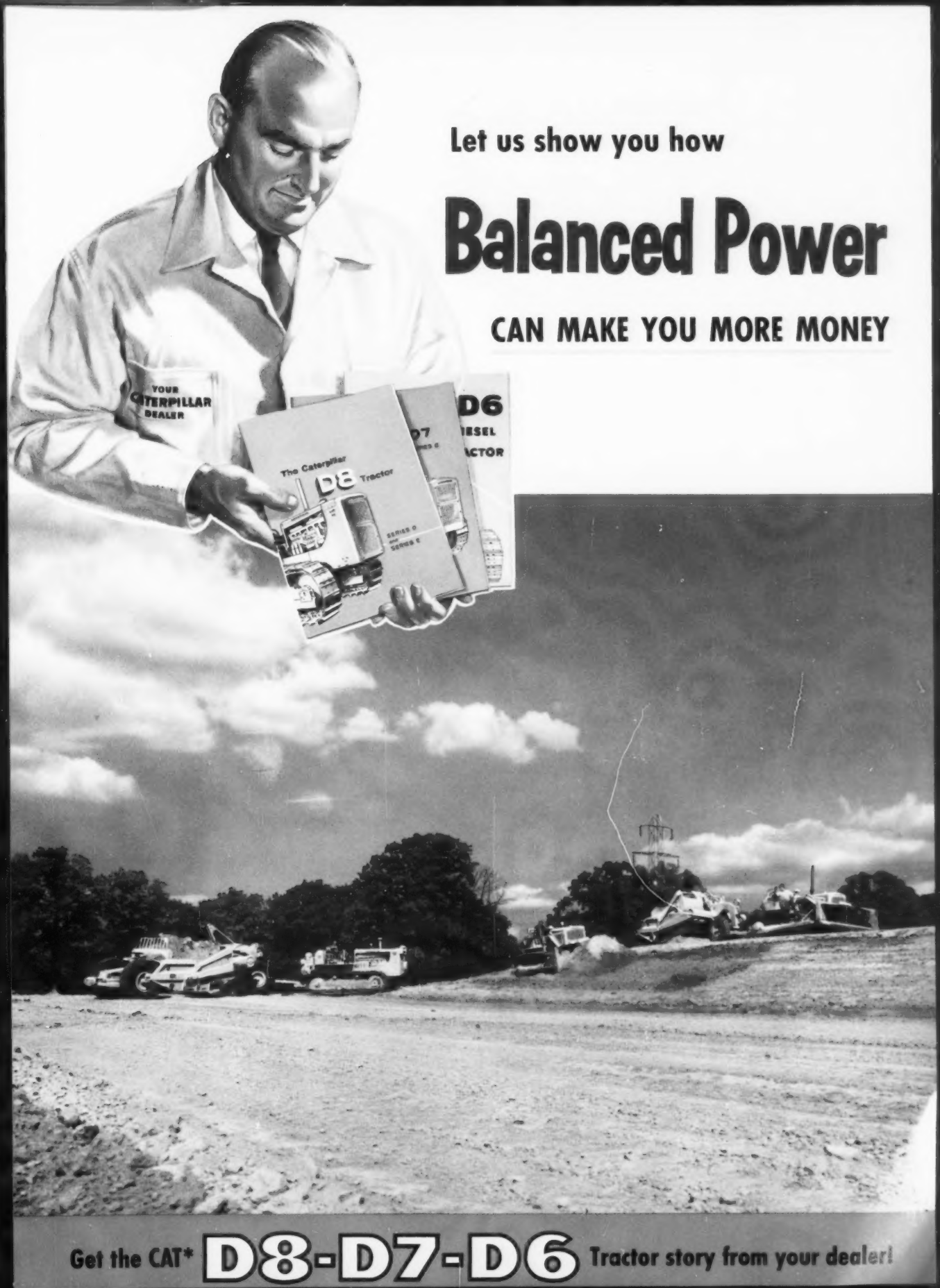
While painting is sometimes a forgotten item, or one taken for granted, it is really quite important. Proper painting specifications incorporated into the design can save untold dollars in future maintenance. Practically all structural steel is delivered to the job site as "red iron" and has a primer paint coat applied. In too few cases, painting specifications call for all surfaces damaged in erection and in riveting or welding to be cleaned and reprimed. Oversight would seem to be the only reason for this ommission.

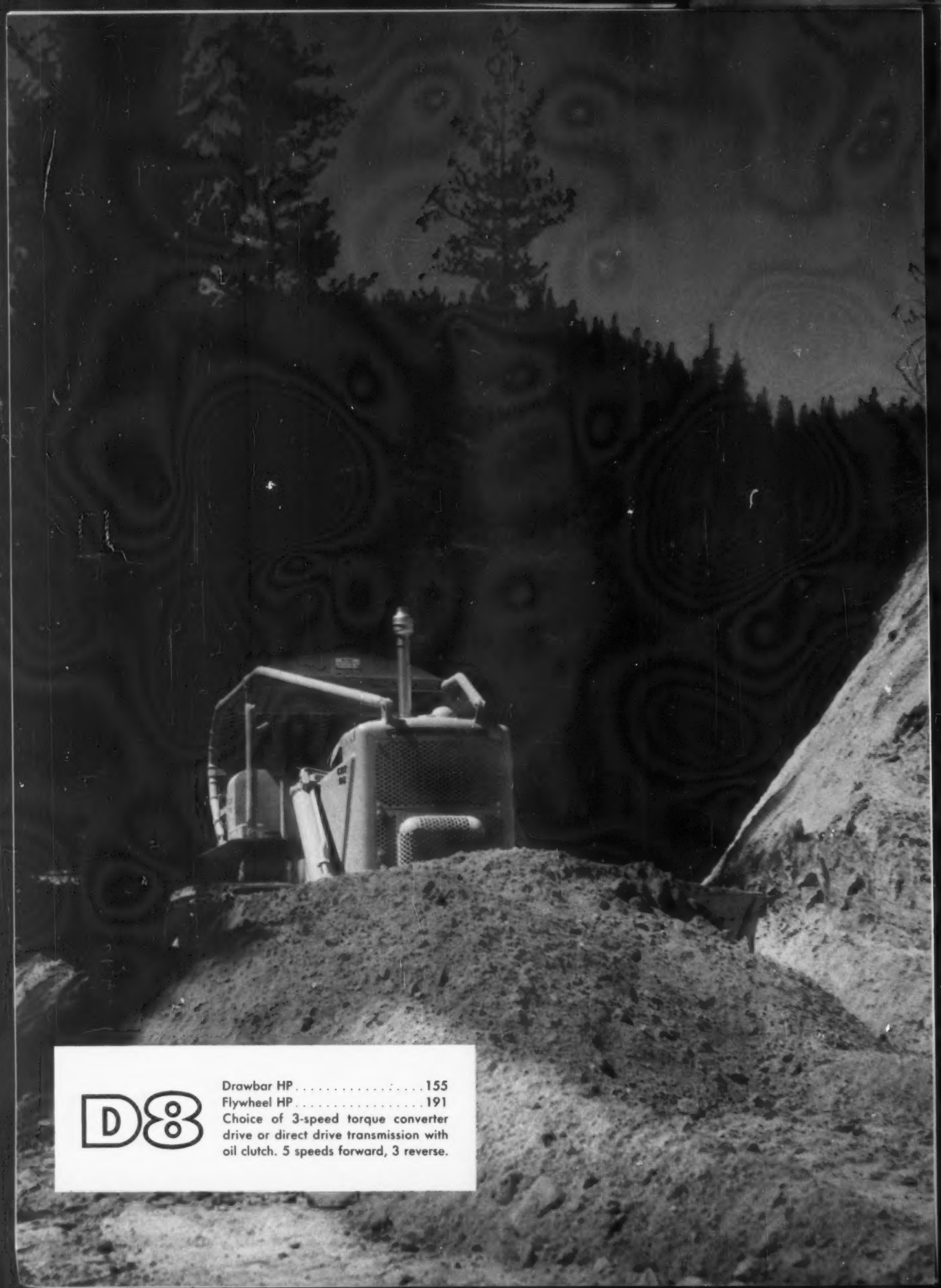
In determining the processes to be used, the equipment to be utilized, and the overall plant design, the operator usually has a certain capital cost figure that cannot be exceeded and still stay within the economics of the project. Any plant contractor will furnish a rough estimate of plant cost expressed as dollars per-ton per-hour and these figures should be looked at carefully before embarking on design. Only the operator is in position to evaluate these preliminary estimated costs and to be aware of what benefits dollar-wise he will receive by processing his coal as he has elected.

In the above the writer has tried to point out and emphasize the importance of consideration of details in arriving at a satisfactory plant design. It long has been considered almost standard practice to begin making plant changes almost before the first ton of coal has been processed. This is costly and unnecessary and can be eliminated or greatly reduced if proper attention is paid to design details.

In many cases those responsible for plant selection do not have time away from pressing operating duties to properly consider all of the fine points, but make only general decisions, leaving details completely in the hands of the contractor's engineers. All plants work and generally do the job for which they were intended, but the design of a plant that is as simple as possible, is the easiest to operate and maintain, and which is as flexible as possible requires a great deal of painstaking scrutiny of details. This is by no means a condemnation of contractor's engineering — they will give their customer what he wants and what is best, if only they are given opportunity to know his desires in detail.

It costs money to process coal and the coal producer should not be further burdened by pyramiding operating and maintenance costs through lack of attention, for whatever reason, to details, however minute, in the design of his plant.


Let us show you how
Balanced Power
CAN MAKE YOU MORE MONEY
YOUR
DEALER
The Caterpillar
D8 Tractor
SERIES D
AND
SERIES E
D6
Get the CAT* D8-D7-D6 Tractor story from your dealer!



D8

Drawbar HP 155
Flywheel HP 191
Choice of 3-speed torque converter drive or direct drive transmission with oil clutch. 5 speeds forward, 3 reverse.

CAT D8-D7-D6 Tractors

workhorses of the construction industry

meet your requirements with

Balanced Power

Balanced power: The right combination of Cat D8, D7 and D6 Tractors plus the right combination of matched equipment can help you get maximum production from your men and machines. Let's talk over your equipment needs. We'll be glad to show you the advantages you can realize with *balanced power.*

Right equipment when and where you want it: The Cat D8, D7 and D6 Tractors shown here bring you the right combination of power and versatility. They have the power you need for short to medium hauls or operation in rough terrain where geared-to-the-ground traction is essential. They have the versatility to work profitably on a wide variety of applications.

Balanced design: In each model, all major components including diesel engine, transmission, final drives, tracks, etc.—plus a complete line of matched equipment—are designed and built by Caterpillar for perfect machine balance and unified manufacturer responsibility.

Balanced power permits standardization: Standardizing on Cat-built Tractors simplifies operator training and servicing. Many parts are interchangeable, so your inventory can be reduced. Unit design permits easy removal and servicing of basic assemblies. Standardizing on Cat-built equipment concentrates responsibility for top performance with one manufacturer and one dealer organization.

Compare these Cat track-type Tractor features: *Exclusive Cat-built oil clutch is virtually trouble-free and outlasts ordinary dry clutches by a big margin. Hydraulic boosted steering clutches are standard on D8s, D7s and D6s. The efficient diesel engine burns low-cost fuel. 90° tapered splines assure perfect gear and shaft mating. Critical wearing parts are "Hi-Electro" hardened for longer life.*

D7

Drawbar HP 102
Flywheel HP 128
5 forward speeds—4 reverse speed transmission with oil clutch.

D6

Drawbar HP 75
Flywheel HP 93
5 forward speeds—4 reverse speed transmission with oil clutch.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

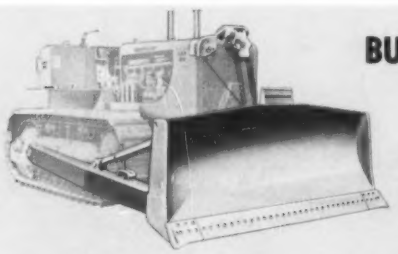
ASK US ABOUT
BALANCED POWER
FOR YOUR FLEET

Balance

YOUR FLEET with the right CAT-BUILT EQUIPMENT

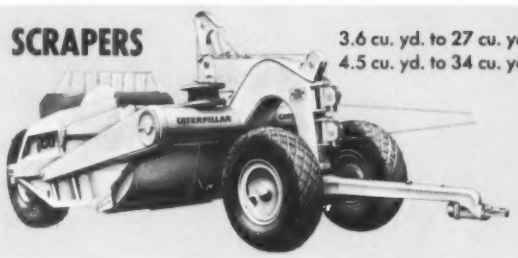
We'll help you equip your tractor with attachments and matched equipment that will increase its profit potential and earning capacity. These products are carefully designed and manufactured to fit correctly, and are matched to the speed and power of the tractor. Cat-built equipment includes straight or angling dozers, single or double drum cable controls, hydraulic controls, scrapers, rippers and many others.

We'll gladly demonstrate how Caterpillar equipment will help make your tractor more productive and versatile, as well as make your operator more efficient.



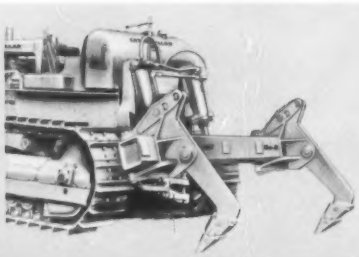
BULLDOZERS

Straight or Angling



SCRAPERS

3.6 cu. yd. to 27 cu. yd. (Struck)
4.5 cu. yd. to 34 cu. yd. (Heaped)



RIPPERS

Tractor-mounted

BECKWITH MACHINERY COMPANY

6550 Hamilton Avenue PITTSBURGH	
Old Town Road CLEARFIELD	
East Broadway FARRELL	PA.
361-369 Congress St. BRADFORD	
1356 E. 12th St. ERIE	
Buckhannon Pike CLARKSBURG	W. VA.

OHIO MACHINERY CO.

6606 Schaaf Road CLEVELAND	
930 Kinnear Road COLUMBUS	
2807 Reynolds Road TOLEDO	OHIO
U. S. Route 250 CADIZ	
4000 Lake Park Road YOUNGSTOWN	

WALKER MACHINERY CO.

1545 Hansford Street CHARLESTON	
4010 Emerson Avenue Route #2 PARKERSBURG	W. VA.

CM-7V

DT1724

Printed in U.S.A.

Headquarters for BALANCED CAT-BUILT POWER

the COAL INDUSTRY must meet its TECHNICAL CHALLENGE

Launching of the first satellite moon by Russia has awakened the United States to the need for training future scientists and to support basic or pure research that will provide the fertile seed of future technology. From the knowledge of launching that satellite will come much new knowledge, much less spectacular, but more important.

Through advancing technology man is producing tremendous changes. There is no question of the accomplishments, or of the future possibilities of technology.

The technological challenge of the coal industry must be met.

Concentration of human effort has moved mountains. Able men applying themselves to a given task can produce major pioneering achievements.

Present problems in the coal industry require an immediate and massive attack, an attack with a concentration of effort, manpower, and brain in a single objective. Properly executed, such an attack could produce important and far-reaching results.

Take away from man the desire to progress and you no longer have man. This fact is as true in stripping coal as in any other endeavor by mankind, and is demonstrated at the operation of C. H. Snyder at Cowansville, Pa.

Like many other men in the coal stripping industry, Mr. C. H. Snyder started as operator of stripping equipment. A strong desire to progress was responsible for his starting an operation of his own. That same strong desire is responsible for the continuous improvements carried that culminated in the present modern type stripping machinery at his mine. This machinery consists of a new model 2400 Lima dragline with 120 foot boom and 6½ yard bucket which enable him to uncover desired amounts of coal each day at a considerable reduction in hours of operation.

Lima Model 2400 dragline does all the stripping.

MODERNIZATION with STANDARDIZATION result in efficient operation at C. H. SNYDER COAL CO.

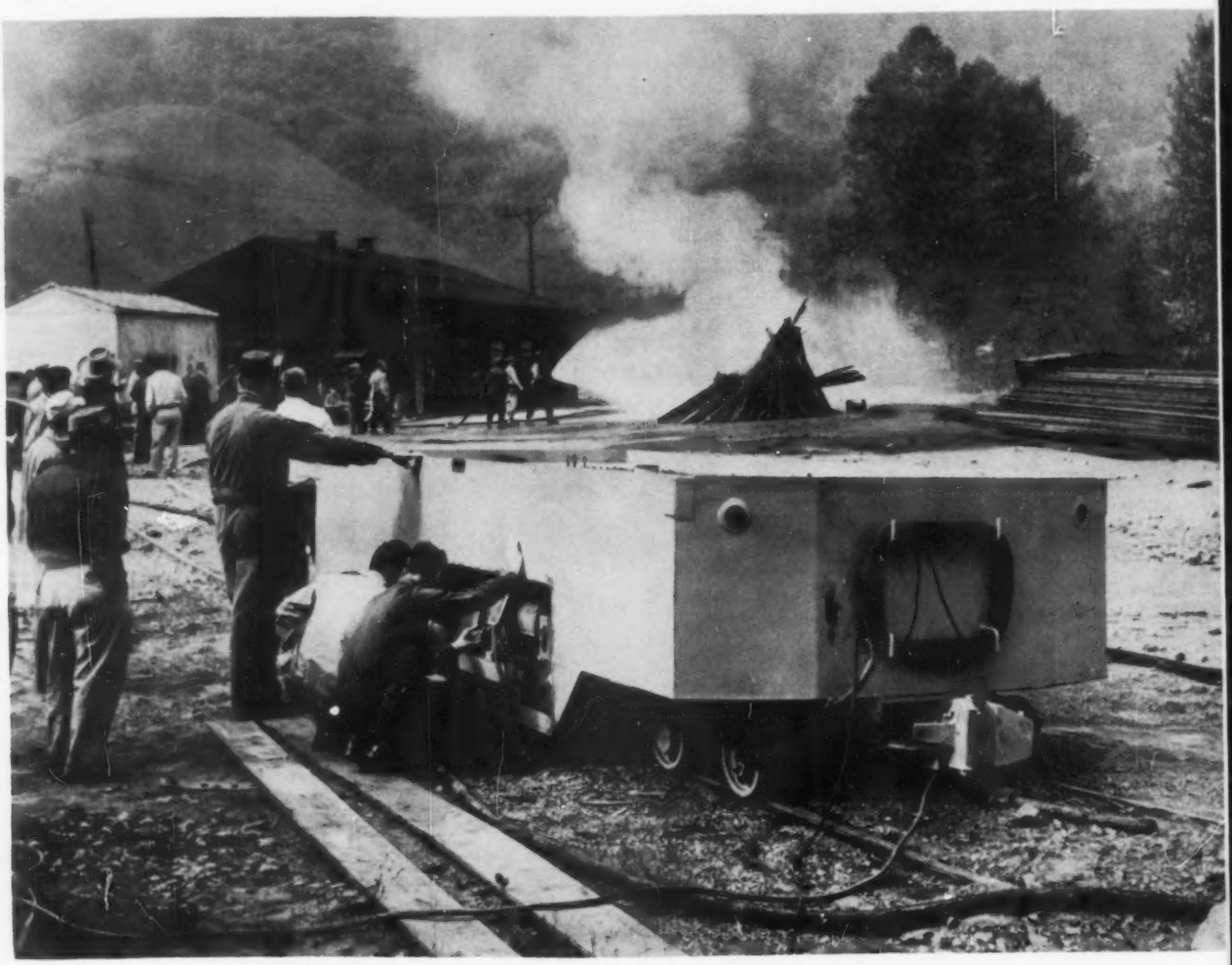
Allis-Chalmers Grader cleaning surface of stripped coal.

Two seams of coal are being stripped. The Freeport seam, lying in the higher hills runs 36 inches in thickness. The lower coal belongs to the Lower Kittanning group and runs 32 inches in thickness.

The surface of stripped coal is creaned with an Allis-Chalmers Model AD 40 road grader. The coal is loaded out with a Lima Model 703 shovel having 1¼ yard dipper. An Allis-Chalmers HD-21 tractor makes benches for the large dragline and does other work around the operation. Production runs 800 tons per day.

Lima Model 703 shovel loading out coal.

Allis-Chalmers HD 21 tractor making bench for the large dragline.



Miners demonstrate fire-fighting effectiveness of MSA Model 2100 Mine Fire Truck built for Pittsburgh Coal Company. Designed to remain underground at all times, the highly maneuverable truck delivers 2100 gallons of water to the scene for rapid discharge at high pressure, either in direct stream or fog. The fire truck is 18 feet long, 7 feet wide and only 50 inches high.

Fire-fighting is hard work anywhere, but underground in a coal mine the difficulties facing firefighters are almost unbelievable.

Drafts of air feed the flames, heavy smoke and gases repel the firefighters, there is a constant danger of explosions and cave-ins and it is difficult to bring equipment close to the fire for effective use.

Realizing these difficulties, Pittsburgh Consolidation Coal Company's operating divisions last year set out to develop equipment suitable to combat mine fires, before many of these problems can develop.

Forward-looking management of Pittsburgh Coal Company, one of the operating divisions of "Pitt Consol," decided that the problem could best be answered with a mine fire truck capable of remaining underground at all times, carrying a heavy "payload" of water, and pressure equipment capable of directing the water to the spot where it would do the most good.

With these prime objectives in mind, the Pittsburgh Coal Company consulted engineers of Mine Safety Appliances Company of Pittsburgh, world's leading producer of safety equipment.

Soon, MSA draftsmen were working on plans for a new type of underground fire truck. The result was the M-S-A Model 2100 Mine Fire Truck, which was recently "unveiled."

Officials of Pittsburgh Coal expressed satisfaction with the new fire truck and believe it is the answer to their needs on this phase of their mine safety program.

The Model 2100 was tested extensively under all conditions at various mines of Pittsburgh Coal. It is compact, low-slung, highly-maneuverable and has a combination fog and straight stream nozzle of advanced design.

Its chief recommendation is its ability to deliver 2100 gallons of water to the scene, ready for rapid

FIRE FIGHTING

discharge at high pressure. A heavy stream of water can be projected from the nozzle for a distance of 100 feet or more, with almost no arc. This is important because of the low roofs in most mines.

Because the Model 2100 is of rugged construction, it can remain underground close to points where it may be needed. Even the 600 feet of M-S-A Firehose with which it is equipped can remain in the mine indefinitely. The newly-developed M-S-A Firehose is impervious to oil, acids, rot and vermin. After use, it can be replaced atop the fire truck without drying or other attention. This hose is highly resistant to abrasions.

The Fire Truck is 18 feet long, seven feet wide and 50 inches high. Units of lesser height and width are available where clearance is limited. The unit carries 200 feet of single conductor cable on a reel at the rear of the tank. Pump motor assembly, including controls and valves, is recessed in the side of the tank for ease of "hook-up" and maintenance.

The tank's high water pressure is delivered by a 20-horsepower, 3500-RPM electric motor directly coupled to a two-stage centrifugal pump rated at 100 gallons of water per minute at 200 pounds per square inch pressure.

Pittsburgh Coal now has 12 of the new Fire Trucks in operation and additional units on order.

Pittsburgh Consolidation, which was formed by a merger in 1945, is one of the country's large commercial, independent coal producers. It has 30 mines in Ohio, Pennsylvania, Virginia and West Virginia.

Force of direct stream discharge from MSA Model 2100 Mine Fire Truck scatters dirt and rock. Stream can be projected for more than 100 feet with almost no arc; yet nozzle can be adjusted to create effective fire fighting fog. Built for Pittsburgh Coal Company the fire truck can stay underground at all times, ready to deliver 2100 gallons of water. It is compact, low-slung and highly maneuverable, measuring 18 feet long, seven feet wide and only 50 inches high.

GERMS MAY TAKE PART IN VITAL MINERAL PROCESSING

The same bacteria that cause diseases and form antibiotics to combat diseases are expected to play important roles in future recovery of valuable metals from low-grade ore and in producing synthetic fuels from oil shale.

The U. S. Bureau of Mines revealed here that four of its laboratories are conducting small-scale research.

Already, the Bureau reports, copper, nickel, cobalt and other metals have been recovered from low-grade ores mixed with bacteria. Researchers reported the presence of bacteria in small samples of ores enabled them to extract many times the amount of metal that could have been recovered without the bacteria.

The bacteria oxidize sulfur contained in the ores to sufuric acid, releasing the free metal, experiments at the Bureau's Eastern Experiment Station, College Park, Md., have shown.

Researchers at the Boulder City, Nevada laboratory have used bacteria to id in recovery of up to 99% of the manganese contained in a low-grade ore.

At Laramie, Wyo., scientists hope to substitute microbes for heat now used to produce petroleum products from oil shale.

Basic research on the bacteria, molds, yeasts and other tiny life forms that exist in coal is being conducted at Bruceton, Pa.

The Bureau of Mines emphasized that the work performed so far has been only on a laboratory scale, however, it does "justify hope that microbes may one day find commercial application" in mineral production.

Buy with CONFIDENCE AT BECKWITH'S SIGN OF BONDED BUY USED EQUIPMENT

BONDED BUY

Know what you are getting! You can buy used earthmoving equipment with the same confidence you have when purchasing new Caterpillar* machinery from us. You'll get honest value for every dollar spent because we offer clear-cut classes of used equipment to meet your requirements and your budget.

The machines tagged with "Bonded Buy" represent only the best in used Caterpillar-built units. Each "Bonded Buy" machine is backed by our Guarantee Bond equal to the purchase price of the machine up to a maximum of $10,000.00. This means that you have a guarantee for 30 days against unsatisfactory performance due to defective parts. If a part should prove defective within the guarantee period under normal conditions of your job and with proper maintenance, we'll put your machine back into operating condition with no charge for parts and labor up to the amount of the bond. Our Guarantee Bond is backed by Lumberman's Mutual Casualty Company—your assurance of the best in used equipment.

The "Certified Buy" class of used equipment covers machines of any make in good condition. We'll furnish you with a performance guarantee in writing on these units. For real bargains in used machines look over the items labeled "Buy and Try." Purchase and try them for a period mutually agreed upon. You be the judge . . . because each "Buy and Try" machine carries our "money-back" guarantee. This is the kind of deal that's impossible to beat!

Best of all, there are excellent buys in all classes of machines, so if you want to invest just a little or a reasonable sum, there is probably a machine waiting for you. In addition, terms can be arranged to suit your plans. Why not stop in at one of our conveniently located plants and discuss your used equipment requirements with us!

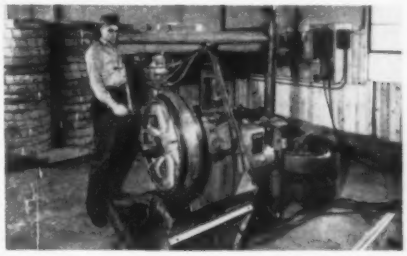
*Both CAT and CATERPILLAR are registered trade marks of The Caterpillar Tractor Co.

BECKWITH MACHINERY CO.

6550 Hamilton Avenue • PITTSBURGH • Phone: MOntrose 1-6900

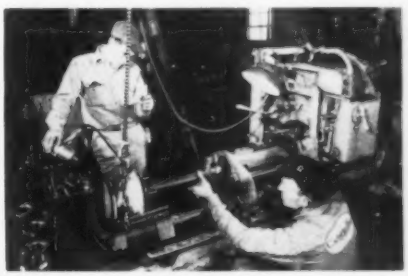
BRADFORD, PA. • 361-369 Congress St. • Phone 3166
CLEARFIELD, PA. • Old Town Rd. • Phone 5-9635
ERIE, PA. • 1356 E. 12th St. • Phone 4-2494
FARRELL, PA. • E. Broadway • Phone Di. 6-3572
CLARKSBURG, W.VA. • U.S. Rt. 20 • Phone Main 4-5476

Here are some of the reasons Beckwith can offer you such good used equipment at such reasonable prices . . .



Idlers may be worn on machines taken in trade but be basically good. Weld overlays made by experienced welders operating modern machines quickly restore them to useful life on reconditioned machines.

If the splines, hub and spokes are in good condition, our experienced servicemen can cut off the worn rims and replace them with genuine Cat replacement rims. This results in a good job at low cost, helps keep the used machine price down.



When the bronze bearing wears out of the original track roller bushing assembly it is a simple matter for our men with their proper equipment to install a new one. Again . . . parts costs are kept low, the reconditioned machine sells at a lower price.

Beckwith's Cat servicemen have the skill, experience and special equipment to make necessary repairs at reasonable cost. Savings are passed on to you in bargain priced used machinery.

How 1 tractor handles all clean-up around fleet of scattered shovels

At this large open-pit copper mine in Arizona, copper is produced from huge tonnages of rock and ore that are mined each day. Equipped with Angledozer and tilt mechanism, 210 hp Tournatractor makes quick work of clearing shovel-spillage from railroad tracks.

A large open-pit copper mine in Arizona uses only one tractor for all clean-up around their widely scattered production shovels. It is the 210 hp rubber-tired LeTourneau-Westinghouse Tournatractor®. Here's how this 17 mph tractor operates during a typical 8 hour day:

Averages 10 min. per shovel

When the 6-yd. shovels have completed loading a string of ten to twelve 84-ton capacity rail-cars, Tournatractor drives in and goes to work. Straddling the rails, this rubber-tired tractor efficiently dozes shovel spillage off tracks with its Angledozer* blade. At each shovel, speedy Tournatractor cleans-up loading area and railroad track in about 10 minutes!

Takes shortest route to next location

When each assignment is finished, Tournatractor operator just flips instant-shift lever and he's on his way to the next shovel. There are no delays for crawling or load-and-haul to new location. A mile is only a couple minutes away! Tournatractor always takes the shortest, fastest route to the next work location . . . often "runs" down steep "shot" banks to lower benches. Big, low-pressure tires do not damage air-drill hose lines, RR tracks, ties, switches, or haul road surfacing.

"You can't beat Tournatractor"

Handling all clean-up work for the shovels . . . plus completing numerous scattered maintenance jobs during his 8 hour shift . . . Tournatractor operator said, "You can't beat this tractor for clean-up work. This is the place for rubber . . . I can move around faster than a pick-up truck on some of our benches."

For more information

If you use several crawler-tractors for clean-up at your pit, plant, and stockpiles, investigate how Tournatractor's power . . . traction . . . speed . . . and "go-anywhere" mobility can pay off for you. We'll be glad to demonstrate Tournatractor at your pit . . . let you judge for yourself.

*Trademark CT-1482-M-1

Go-anywhere Tournatractor "runs" down a "shot" bank to shorten travel time between shovels. With big, multi-disc air brakes — totaling 3,762 sq. in. of brake surface — operator has sure, safe control at all times.

Crossing tracks, Tournatractor's big, low-pressure tires deflect to prevent damage. They do not loosen rails, damage ties or switches.

Furnival Machinery Co.

Lancaster Avenue at 54th Street
PHILADELPHIA 31, Penn.
Phone: Trinity 7-5200

5105 Paxton Street
P.O. Box 786
HARRISBURG, Penn.
Phone: CEdar 8-1781

S. Water St., P.O. Box 553
(Pottsville Region)
NEW PHILADELPHIA, Penn.
Ph Market 2-8020

Also Sales & Service for:

- Jackson Vibrators
- Chain-Belt Rex Products
- Cleveland Trenchers
- Ingersoll-Rand Compressors
- Marion Power Shovels
- John Deere Industrial Tractors
- Quick-Way Truck Shovel Co.

ALLIS-CHALMERS MODEL HD21, Serial No. 7015, equipped with 21BD hydraulic bulldozer blade — heavy duty radiator guard; crankcase guard; idler, sprocket and truck roller guard; 24 volt electric lighting system; torque converter. Rebuilt with 90 day warranty $29,500.00

ALLIS-CHALMERS MODEL HD20, Serial No. 3489, with aBker hydraulic bulldozer blade and canopy type cab; radiator guard; crankcase guard; pull hook; idler, sprocket and truck roller guard; torque converter; electric starting and lighting. Rebuilt with 90 day warranty $19,500.00

CATERPILLAR MODEL D-7, Serial No. 17A-1577, with hydraulic bulldozer blade; crankcase guard; pull hook; idler, sprocket and truck roller guard; electric starting. Good operating condition $12,500.00

CATERPILLAR MODEL D-7, Serial No. 3T-24257, with Caterpillar hydraulic bulldozer blade; crankcase guard; front pull hook; idler, sprocket and truck roller guard; and canopy type cab. As inspected $7,500.00

INTERNATIONAL MODEL TD-18, Serial No. 12738, with hydraulic angledozer blade; crankcase guard; truck wheel; idler, sprocket and truck roller guard. As inspected $5,850.00

HOUGH MODEL HMD, Serial No. 90882, with Hercules diesel engine, 1½yd. bucket capacity. Rebuilt with 60 day warranty $7,500.00

MICHIGAN MODEL 75-A, Serial No. 10032-D with Waukesha diesel engine, torque converter, power sihft transmission, planetary drive and 1¼ yd. bucket capacity. $11,950.00

CATERPILLAR MODEL 12 GRADER, Serial No. 9K-2953 with fully enclosed cab, power circle turn, leaning front wheels, 13.00 x 24 rear tires and 7.50 x 24 front tires. 30 day warranty $6,500.00

ALLIS-CHALMERS MODEL 45 GGRADER, Serial No. 45111 with scarifier, 13.00 x 24 tires, power circle turn, hydraulic shiftable moldboard, fully enclosed cab, defroster and heater. 60 day warranty $12,500.00

LIMA MODEL 34 PAYMASTER, Serial No. 4993, with ¾ yd. shovel attachment, standard track, General Motors 371 diesel engine, new bucket and new sticks. 90 day warranty. $14,500.00

LORAIN MODEL 85 DRAGLINE, Serial No. 26062, 70 ft. boom, 2½ cu. yd. dragline bucket, Waukesha diesel engine. Approximately 2 years old. Excellent condition. $45,000.00

MANITOWOC MODEL 3500, 1¼ high front with Hercules diesel engine, 1½ cu. yd. bucket shovel. Good operating condition $25,000.00

HIGHWAY EQUIPMENT COMPANY

6465 Hamilton Avenue Phone: EMerson 1-3600 Pittsburgh 6, Pa.

CHEMIST (Fuel Technoogist), A.R.I.C., A.M.Inst.F., M.C.I.C., Age 29, married, British. 11 years extensive experience in general analysis, coal preparation, boier and sewerage plant operation. Desires responsible position with prospects of advancement.

FOR SALE

EUCLID TRUCKS—Rear, Bottom Dumps and Scrapers
SHOVELS, DRAGLINES — All sizes, makes. Crawler and walking type, diesel and electric powered.
120B BUCYRUS ERIE—Electric shovel, 6 yd.
WELL DRILLS—Rotary and Churn type.
TRUCK CRANES, CRAWLER CRANES
DOZERS — FRONT END LOADERS and GRADERS
CATERPILLAR MOTOR SCRAPERS—DW21
"Other Equipment available not listed above."

WILLIAM LUBRECHT, III
Construction Equipment
311 W. Diamond Ave. Hazelton, Pa.
Gladstone 5-4041 — 5-0253

It Pays to Advertise in Coal Mining

COAL STRIP WANTED

Complete with equipment, must be low down payment and reasonable terms. All details first letter, price, terms, haul, coal, cover, tipple, equipment, etc.

ROLLING HILLS CONT. CO.
884 Edgewood Ave. Pittsburgh 34, Pa.

FOR SALE

Manitowoc 4500—5 yd. Dragline, A-1.
Manitowoc 3000—1¾ yd. good condition
Osgood 800 Shovel, 1½ yd., good condition.
Lot { Marion 40A Drag, 3 yd. — P18955, 2 yd. — D8 Dozer and D7 Dozer, all in good operating condition.
Lot { Joy 8 BU — GE 8 ton — Goodman Cutter — Jeffrey 35 B Cutter — 100 MG Set — 42" ga. D-B Mine Cars, 5 ton.
Goodman 512 Cutters with 10' bars.
GE 30 Locomotive, 42-44 ga., like new.
Joy Miner 3JCM 4CE, ready to work.
Compton Hy Wall Auger, 48" or 42", complete.
500 H.P. Mine Slope Hoist, complete.
Compton Hy Wall Auger, 30" or 42", complete.
500 KW — MG Set — 2300 A.C. — 250v. D.C.
Small Deep Mine 500TPD Pgh. Coal Seam.

T. L. SIMPSON
MACHINERY AGENT
1200 Woodbourne Ave. Pittsburgh 26, Pa.
Phone LEhigh 1-2254

FOR SALE

MANITOWOC Model 3500 Stripping Shovel, with 35 foot boom, 27 foot stick, 2½ yd. dipper, powered by D-17000 Caterpillar Engine. Good condition.

ANDERSON EQUIPMENT CO.
P. O. Box 427, Bridgeville, Pa.
Phone: CAnal 1-5300

FOR SALE

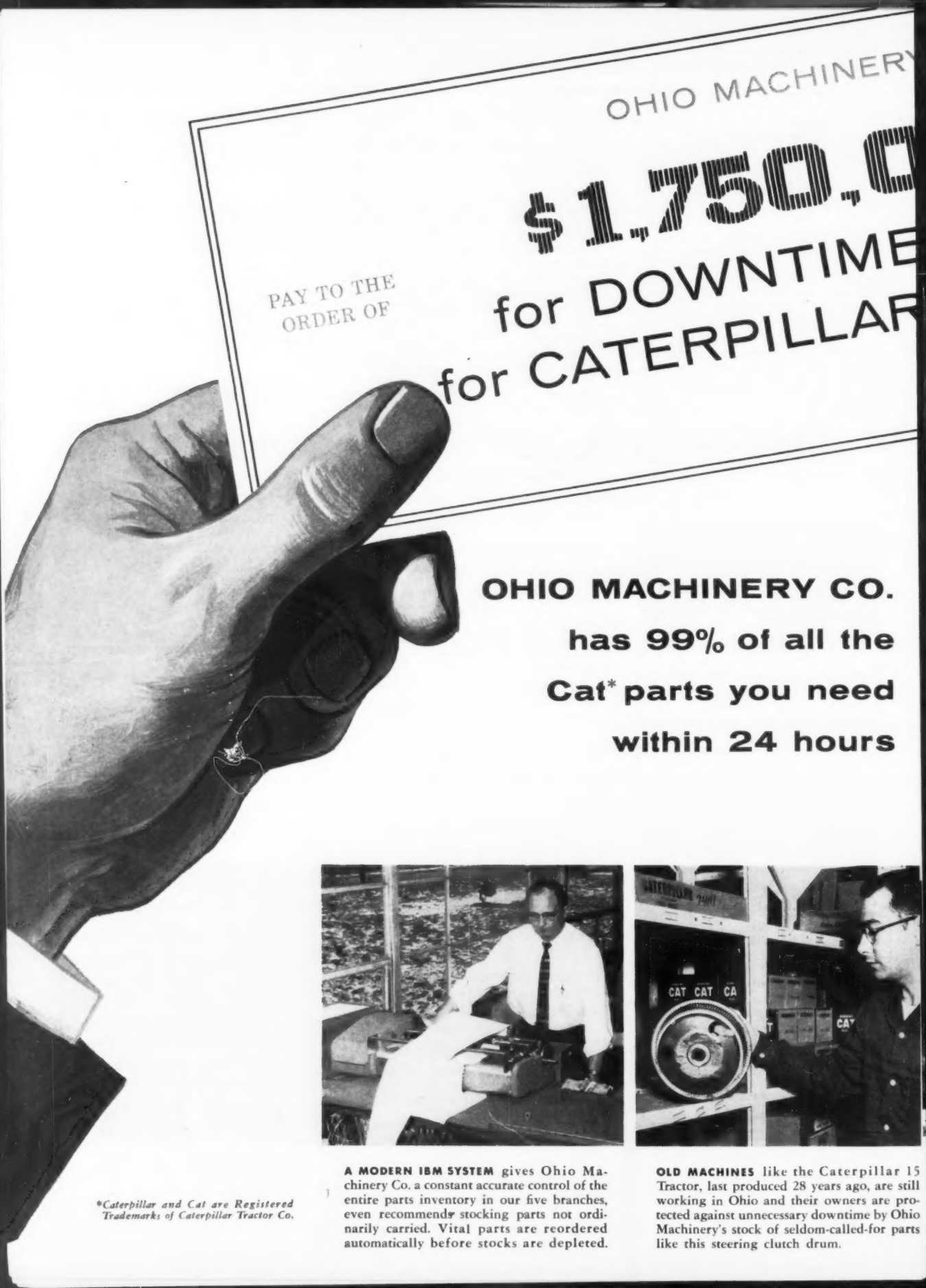
Bucyrus 9-W, diesel dragline, 165' boom, 9 yd. bucket, excellent condition. Western Penna. $175,000 includes approx. $20,000 spare parts.

ROLLING HILLS CONT. CO.
884 Edgewood Ave. Pittsburgh 34, Pa.

SHOVELS — DRAGS
CRANES
DRILLS — EUCLIDS

5150 Bucyrus Monighan Drag, 165 ft., 9 yd.
7490 Marion Drag, 160 ft., 13 yd.
625 Page Diesel Drag, 150 ft., 10 yd.
621-S Page Diesel Drag, 135 ft., 6 yd.
2400 Lima Dragline, 130 ft., 5 yd.
4500 Manitowoc Drag, 120 ft., 5 yd.
5-W Bucyrus Erie Drag, 120 ft., 5 yd.
111-M Marion Drag, 100 ft., 4 yd.
1055 P & H Dragline, 100 ft., 3½ yd.
54-B Bucyrus Erie 6½ yd. Elec. Shovel.
2400 Lima 5½ yd. H. L. Shovel.
120-B Bucyrus Erie 4 yd. Elec. Shovel.
88-B Bucyrus Erie 4 yd. Standard Shovel.
1201 Lima 2½ yd. H. D. Shovel.
54-B Bucyrus Erie 2½ yd. Standard Shovel.
3500 Manitowoc 2 yd. H. L. Shovel.
Unit 1020 ¾ yd. Shovel.
Also, various smaller Shovels and Drags.
400 Reich Truck Mounted Rotary Air Drill.
600 Reich Heavy Truck Mounted Rotary Air Drill.
McCarthy Coal Recovery Auger Drill.
Euclid Trucks — Rear and oBttom Dump.
Dozers, Scrapers, Graders, Front End Loaders.

FRANK SWABB
Equipment Co., Inc.
313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa., GLadstone 5-3658



OHIO MACHINERY CO. has 99% of all the Cat* parts you need within 24 hours

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

A MODERN IBM SYSTEM gives Ohio Machinery Co. a constant accurate control of the entire parts inventory in our five branches, even recommends stocking parts not ordinarily carried. Vital parts are reordered automatically before stocks are depleted.

OLD MACHINES like the Caterpillar 15 Tractor, last produced 28 years ago, are still working in Ohio and their owners are protected against unnecessary downtime by Ohio Machinery's stock of seldom-called-for parts like this steering clutch drum.

CO.

OO

NSURANCE

OWNERS

OHIO MACHINERY CO.

● How can Ohio Machinery fill 99% of all parts orders within 24 hours? (94% from their own bins!)

First, because Ohio Machinery maintains a larger supply of factory-made parts in each of its five locations than any other construction equipment outlet in Ohio. The total parts inventory represents an investment of $1,750,000 by Ohio Machinery to help Ohio contractors keep their Caterpillar-built machines on the job.

Second, because a modern IBM parts control system gives us an accurate, up-to-the-minute analysis of the entire parts inventory, signaling which parts need reordering and which are adequately stocked. It records every part bought by our customers during the past ten years. This enables Ohio Machinery to guess accurately which one of some 105,000 different Caterpillar parts you might need tomorrow.

Third, because Ohio Machinery's parts managers analyze every new model to determine which parts could cause downtime—cost you money. So even without a parts history, we can stock the most vital parts to protect Caterpillar owners.

The percentages are good, but we're trying to do even better. The real proof of our parts service is how we handle *your* parts problems. Call us when you need help.

Ask about our new Parts SWAP Plan!

OHIO MACHINERY CO.

THE BEST IN CONSTRUCTION AND EARTHMOVING EQUIPMENT

6606 SCHAAF ROAD
CLEVELAND 9, OHIO

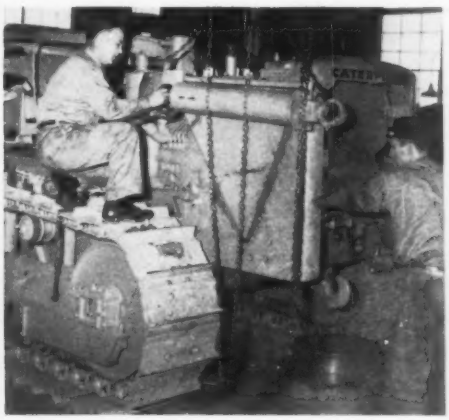
940 KINNEAR ROAD
COLUMBUS 16, OHIO

2807 REYNOLDS ROAD
TOLEDO 6, OHIO

4000 LAKE PARK ROAD
YOUNGSTOWN, OHIO

U. S. ROUTE 250
CADIZ, OHIO

PARTS WHEN YOU NEED THEM are assured by Ohio Machinery's $1,750,000 stock of genuine Caterpillar parts—parts you know you can trust. One of our five locations is only hours away from your jobs in Ohio. All parts and service work are guaranteed.



75 SKILLED SERVICEMEN using specialized machinery and repair tools and precision testing equipment – in the field or in the shop—complete the service phase of our parts story. They install only genuine new Cat parts or factory-approved rebuilt parts.

OWNERS OF THE NEW D9 were protected by a $85,000 stock of D9 parts a few months after the first tractor arrived in Ohio. Every new Cat* model is analyzed to determine, in advance, which parts could cause downtime.

ADVERTISER'S INDEX

FEBRUARY, 1958

● C. D. McDowell has been elected secretary-treasurer. Mr. McDowell has been with the Harlan Association for the past six years as assistant secretary.

● George S. Ward, secretary of the Harlan County Coal Operators Association at Harlan, Ky., for more than a quarter-century, died in a Knoxville hospital Sept. 21. Mr. Ward, who was 67, had suffered from a heart condition for some time.

● Major advances in design of the Allis-Chalmers HD-21 turbocharged diesel powered tractor are described in the two-color, 16-page catalog (MS-1243) now available from the Construction Machinery Division, Allis-Chalmers Manufacturing Co., Milwaukee, Wis. Photographs and other illustrations point to these features and help tell the engineering and construction story of the tractor. Matched equipment and the line of accessories for the HD-21 are also pictured. Tractor specifications are included.

What makes equipment good?

Modern design . . . sturdy construction . . . 'round the clock service!

You can expect all this and more on every item — large or small — you buy from Highway.

AA-6629

Allis-Chalmers HD-21 clearing overburden on Harold A. Siegel Coal Co. operation, near Fryburg.

Lima 2400 removing overburden in cut for Harold A. Siegel Coal Co., Fryburg.

Lima 2400 stripping for J. Russel Cravener Co., Echo.

25TH Anniversary HIGHWAY EQUIPMENT CO. 1933 · 1958

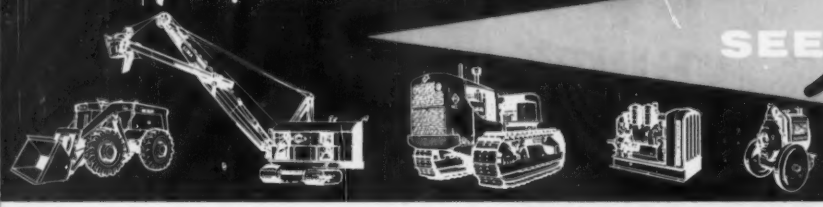
HIGHWAY EQUIPMENT COMPANY

6465 Hamilton Ave. • Pittsburgh 6, Pa.

Allis-Chalmers • Lima Shovels, Cranes, Draglines • Master
General Motors Diesel Engines • Power-Pack Conveyors
Gar Wood • Lima Roadpackers • Burmeister Mixers and Bins
Michigan Tractor Shovels and Excavator-Cranes
Thor • Jaeger

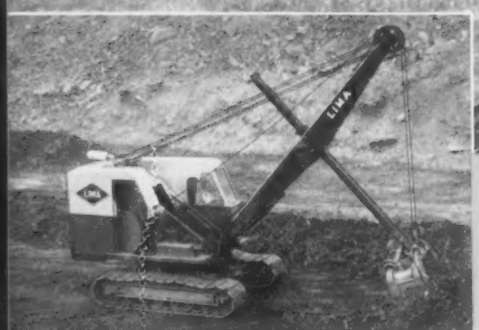
For the best in all types of mining equipment...

SEE Highway FIRST!



Allis-Chalmers and Lima... form perfect combination for CLARK & KRCHMAR COAL CO.

Clark & Krchmar's Lima 2400



In addition to its Lima 2400, Clark & Krchmar also uses a Lima 44.

And . . . like all leading mines, Allis-Chalmers HD-21s are on the job 24-hours-per-day every day at Clark & Krchmar Coal Co.

Clark & Krchmar Coal Co., Portersville, is just one of many leading firms that depend on equipment from Highway to speed stripping and cut production costs.

You will find it profitable to discuss your needs with your Highway representative. Regardless of the nature or size of your requirements, Highway is prepared to serve you promptly, efficiently, economically.

Highway

HIGHWAY EQUIPMENT COMPANY

6465 Hamilton Ave. • Pittsburgh 6, Pa.

Allis-Chalmers • Lima Shovels, Cranes, Draglines • Master General Motors Diesel Engines • Power-Pack Conveyors Gar Wood • Lima Roadpackers • Burmeister Mixers and Bins Michigan Tractor Shovels and Excavator-Cranes Thor • Jaeger